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PLANT IMMIGRANTS

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Foreign Seed and Plant Introduction.

E X P L A N A T O R Y N O T E .

This multigraphed circular is made up of descriptive notes furnished mainly by Agricultural Explorers and Foreign Correspondents relative to the more important introduced plants which have recently arrived at the Office of Foreign Seed and Plant Introduction of the Bureau of Plant Industry of the Department of Agriculture, together with accounts of the behavior in America of previous introductions. Descriptions appearing here are revised and published later in the INVENTORY OF PLANTS IMPORTED.

Applications for material listed in these pages may be made at any time to this office. As they are received they are placed on file, and when the material is ready for the use of experimenters it is sent to those on the list of applicants who can show that they are prepared to care for it as well as to others selected because of their special fitness to experiment with the particular plants imported. Do not wait for the annual catalogue entitled NEW PLANT INTRODUCTIONS in which are described the plants ready for sending out.

One of the main objects of the Office of Foreign Seed and Plant Introduction is to secure material for plant experimenters, and it will undertake as far as possible to fill any specific requests for foreign seeds or plants from plant breeders and others interested.

David Fairchild,

Agricultural Explorer in Charge.

March 29, 1917.

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Acacia visco Lorentz. (Mimosaceae.) 43453. Seeds of the *visco* from Argentina. Collected by H. M. Curran. A tree, native of northern Argentina, commonly unarmed, but occasionally with re-curved thorns. The leaves consist of three to six pairs of pinnae, and the flowers are sessile. The walnut-colored hard wood is striped and much appreciated on account of its resistance to moisture. It is not abundant, and is used for all kinds of carpentry. (Adapted from Grisebach, *Plantae Lorentzianae*, p. 122, and from Lillo, *Contribucion Arboles Argentina*, p. 36.) "Timber tree. Yields a very hard durable wood but is a small tree of the dry regions and should be useful for planting in the Mesquite areas of the south-west." (Curran.)

Achradelpha viridis (Pittier) O. F. Cook. (Sapotaceae.) 43439. Seeds of *injerto* from Palin, Guatemala. Collected by Mr. Wilson Popenoe, Agricultural Explorer. "No. 46a. *Injerto*. Seeds from fruits purchased in Palin, but said to have been grown at Santa Maria de Jesus, between Palin and Antigua. The *injerto* is a common tree in this part of Guatemala. Unlike its near relative, the sapote (*Lucuma mammosa*), which seems to thrive only at comparatively low elevations in the tropics, the *injerto* is grown as high as 5000 or 6000 feet, and should, therefore, stand a better chance of succeeding in California and Florida than the sapote, which has, so far, been a failure in those states. The tree grows to a height of about 40 feet in this region, and has long, slender leaves suggesting those of the sapote. The fruits vary somewhat in shape, but are commonly round to oval, often pointed at the tip. They are two to three and a half inches in diameter, smooth, dull yellow-green in color, sometimes becoming almost dull yellow. The skin is not thick, and adheres closely to the flesh, which is red-brown in color, soft and melting, sweet with a pleasant flavor, somewhat resembling that of the sapote, but better. The large seed (sometimes there are two) is hard and polished, deep brown in color, and is easily removed from the pulp." (Popenoe.)

Acrocomia mexicana Karw. (Phoenicaceae.) 43484. Seeds of a **palm** from Villahermosa, Tabasco, Mexico. Presented by Mr. G. Itie, Director, Agricultural Experiment Station. "*Coyol de savana* or *cocoyol*. The natives use the fruit in making a dessert, cooking it with brown sugar. Rings are made from the shell." (Itie.)

A prickly palm, about 20 feet high, with a brown woolly trunk up to $1\frac{1}{2}$ feet thick, and terminal leaves from 6 to 8 feet in length. The sheathing bases of the leaves are armed with long, black spines, and the spathe is very spiny. The yellow flowers are very odorous, and the round fruits are about an inch in diameter. This palm is found in the cooler regions of Mexico up to 3000 feet above the sea, and is said to be hardy at Santa Barbara, California. (Adapted from Mueller, Select Extra-Tropical Plants, p. 19, from Bailey, Standard Cyclopedia of Horticulture, p. 211, and from Martius, Historia Naturalis Palmarum, pp. 285, 286 and plate 138.)

Alibertia edulis A. Richard. (Rubiaceae.) 43413. Seeds from Tierras de Loba, Bolivar, Colombia. Collected by Mr. H. M. Curran. A tropical and extra-tropical shrub found in Central and northern South America, with white flowers and yellow fruit, which is about the size of a small lemon, and is called *Marmeladinha*. The entire plant is called *Puruhy*, both of these being Brazilian names. The fruit is edible and very agreeable in taste. (Adapted from von Mueller, Selected Extra-Tropical Plants, from Pittier, Plantas Usuales de Costa Rica, p. 110, and from Correa, Flora do Brazil, p. 112.)

Annona purpurea Moc. & Sesse. (Annonaceae.) 43426. Fruit of *Soncoya* from Escuintla, Guatemala. Seed collected by Mr. Wilson Popenoe, Agricultural Explorer. "The *suncuya* or *soncuya*, sometimes called *chincuya*, a remarkable species of *Annona* which appears to be fairly common in the foothills of the western slopes of Guatemala. Fruits and trees were seen from Escuintla to Ayutla, on the Mexican frontier, the elevation varying from 200 to 1200 feet. The *soncuya* is an immense fruit, often larger than a child's head, and covered with short conical protuberances. It is almost perfectly spherical in form, measures about six inches in length, and weighs three pounds or more. In color it is a light russet brown, sometimes greenish, and the protuberances are about $\frac{1}{4}$ inch long, sharply pointed, and corky in character. The rind also is corky, about $\frac{1}{4}$ inch thick, rather pliable, granular and easily broken. The flesh within is pale orange, cottony in texture, rather juicy and with an aroma and flavor almost identical with that of the North American pawpaw (*Asimina triloba*). The seeds are very

numerous, brown, shaped like that of the cherimoya but much larger, being fully one inch long. The tree is grown in dooryards, and is said also to occur in the forests, but up to the present I have only seen it in cultivation. It grows to about the same size as the cherimoya, and is of the same form, but the foliage is much larger, and makes the tree a striking object in gardens. The fruit is a common object in markets and fruit stalls, and seems to be generally used by the Indians, though an overindulgence in it is said to superinduce *paludismo* or malarial fever. The tree grows on deep loamy soils, very rich and generally moist, and is probably suited only to regions with very warm climate. It if succeeds at all in California, it will probably be only in the most protected locations; in Florida it ought to have somewhat more favorable climatic conditions, at least in the lower end of the peninsula. The soncuya, which is probably unknown in cultivation outside of Central America is a fruit of much better quality than most of the wild annonas, and seems to be especially worthy of attention because of its thick outer rind, which makes it easier to handle the fruits without bruising them, than is the case with the cherimoya." (Popenoe.)

Belou marmelos (L.) Lyons. (Rutaceae.) 43478. Seeds of **Bael tree** from Honolulu, Hawaii. Presented by Mr. J. E. Higgins, Horticulturist, Agricultural Experiment Station. This plant is the *Bael Tree* of India, ascending to 4000 feet above the sea, and found here and there both wild and cultivated throughout India and also Burma. It finally attains a height of 40 feet. The leaves are trifoliate and deciduous, and the greenish-yellow, nearly globular fruit varies from 2 to 6 inches in diameter, being smaller in the wild trees. The hard shell is filled with pale orange, aromatic pulp, in which occur 10-15 long, narrow cells containing the seeds imbedded in transparent gum. The Hindus are very fond of this fruit, and in its green state it is a specific for dysentery. It is now being tested in several places in the United States. (Adapted from Swingle, in Bailey, Standard Cyclopedia of Horticulture, pp. 222, 223, and from Mueller, Select Extra-Tropical Plants, p. 20.)

Berberis fremontii Torrey. (Berberidaceae.) 43474. Plants of **barberry** from Lyford, Texas and San Saba, Texas. Collected by Dr. David Griffiths and grown at

the Plant Introduction Field Station, Chico, Cal. "A native of southern and central Texas. Like the other species of the genus it has ornamental value. Besides this, the berries are used for culinary purposes. In some localities, where the species is very abundant, jellies are prepared and offered for sale on the markets. The species is tremendously variable." (Griffiths.)

Byrsonima crassifolia (L.) H. B. K. (Malpighiaceae.)
Seeds of **Nance** from Guatemala City, Guatemala. Collected by Mr. Wilson Popenoe, Agricultural Explorer. "A small tree frequently seen in gardens, especially in villages along the west coast, where it is a common dooryard tree. It is erect, with a slender trunk sometimes dividing near the base, and up to 35 feet in height. The leaves are obovate-elliptic to elliptic, acute, 3 to 4 inches long, thickly chartaceous, deep green and glabrous above, covered with thick tawny hairs beneath. The fruits are born in short terminal racemes 2 to 3 inches long, and individually are the size of cherries, bright yellow in color when fully. The single rough seed is about the size of a cherry stone. The flavor of the fruit is acid, and sometimes rather strong. The Nance grows here at elevations from sea level up to 4000 feet or above, the soil being usually a rich loam. It may succeed in California, when grown at places such as Santa Barbara, which do not experience a great deal of frost, and it ought to succeed in south Florida." (Popenoe.)

Canarium amboinense Hochr. (Balsameaceae.) 43450.
Seeds from Buitenzorg, Java. Presented by the Director, Botanic Garden. This beautiful tree, which grows to a height of about 90 feet, so resembles *Canarium moluccanum* in general habit and in the leaves that the two can scarcely be distinguished, although the fruit is different. The bark is smooth and white. The fruit of this species is oblong, pointed at both ends, with angles sharp toward the ends and somewhat flattened toward the middle. This tree is found in the island of Amboina, Celebes. (Adapted from Hochreutiner, *Plantae Bogoriensis Exsiccatae*, p. 55.)

Carica papaya L. (Papayaceae.) 43428. Seed of **papaya** from Guatemala City, Guatemala. Collected by Mr. Wilson Popenoe, Agricultural Explorer. "A remarkable variety of papaya which seems to be fairly common in

the markets here, and is said to come from Escuintla. The fruit from which these seeds were taken is cylindrical in form, $13\frac{1}{2}$ inches long by 6 inches thick, pointed at the apex. The flesh was thick, varying from $1\frac{1}{2}$ to $1\frac{3}{4}$ inches, firm, and not at all musky in flavor. It was rather lacking in sweetness but this may have been due in part to the fact that the fruits are some times picked before fully ripe to permit of shipment. The great peculiarity of its variety lies in the color of the flesh, which was a deep reddish salmon. The seeds were oval in form, and quite numerous. Other specimens of this same variety which have been seen in the market were similar to the one described but smaller. This interesting form should be tried in connection with the investigations in papaya culture now being carried on in south Florida." (Popenoe.)

Cedrela fissilis Velloso. (Meliaceae.) 43417. Seeds of **Cedro** from Bolivar, Colombia. Collected by Mr. H. M. Curran. A tree with pinnate leaves 10-15 inches long, densely pubescent beneath, and 18-24 opposite, nearly sessile leaflets. The panicles of whitish flowers are longer than the leaves, and the fruit is a dehiscent capsule containing many flat, winged seeds. According to Franceschi it does better at Santa Barbara than any other species of this genus. (Adapted from Bailey, Standard Cyclopedia of Horticulture, pp. 697-698.)

Chayota edulis Jacq. (Cucurbitaceae.) 43422. Fruits of **Chayote** from Guatemala. Collected by Mr. Wilson Popenoe, Agricultural Explorer. "Large white **perulero**, undoubtedly one of the very best varieties of chayote or *guisquile* grown in Guatemala. Its attractive appearance, smooth surface, freedom from spines and deep sutures, and its excellent quality make it seem worthy of a careful trial in the southern United States. This variety belongs to the class known as *perulero*, or Peruvian chayotes, a group which seems to include a good many small to medium sized, smooth varieties, as distinguished from the *guisquiles* proper, larger fruits, usually with sutures on the surface, and often spiny. This large white *perulero* is considered of superior quality, the flavor being very delicate, and due to the absence of spines and sutures it is very easy to prepare for the table." (Popenoe.)

Chayota edulis Jacq. (Cucurbitaceae.) 43393-43401. From Guatemala City, Guatemala. Collected by Mr. Wilson Poponoe, Agricultural Explorer. "The **chayote** which is here called *guisquil*, is one of the commonest vegetables in this part of Guatemala, and exists in a number of varieties. The following set includes those which have been seen commonly in the market during the past two weeks. Two classes of chayotes are distinguished in the markets, *guisquiles* proper, and *guisquiles pereros*, or Peruvian *guisquiles*. The former includes practically all of the larger fruit, varying from green to white in color, some prickly and some smooth, the surface usually somewhat roughened, sometimes with deep sutures from base to apex. The second class, *guisquiles peruleros*, includes small fruits, white to green in color, with the surface smooth and free from prickles or soft spines. Both classes are exceedingly abundant in the markets."

Chayota edulis Jacq. (Cucurbitaceae.) 43477. Fruits of **Chayote** from Santo Domingo, Dominican Republic. Received through Mr. Carl M. J. von Zielinski, American Vice Consul in charge. "Information from reliable sources states that the cultivation of this plant is very simple. It should be planted in a moist soil preferably where there is plenty of shade. Its growth is said to be wonderful and after ninety days it is known to produce over 100 fruits. There are two kinds of *tallote* as the chayote is called here, found in this country but the difference is said to be only in the color of the skin which is either white or green. The plant is very much liked by the natives and is prepared in many ways for use in soup, and meat dishes; also in the manufacture of candy. Native physicians prescribe it not only as food for children and old people, but also to be used externally. The leaves are boiled and then used to cure rheumatism. Animals are very fond of the fruit as well as the leaves." (Zielinski.)

Chrysophyllum lucumifolium Grisebach. (Sapotaceae.) 43454. Seeds of **Aguay** from Argentina. Collected by Mr. H. M. Curran. A tree, found in Misiones and Corrientes, Argentina, with beautiful broad green leaves and axillary or lateral flowers. Only one seed matures in the oval fruit which is 12 mm. long. This tree sometimes attains considerable size, and the wood, which is flexible and easily split, is used for

fire wood and gun stocks. The fruit is edible and very sweet. (Adapted from Grisebach, *Plantae Lorentzianae*, pp. 223-224, and from Lillo, *Contr. Arboles Argentina*, p. 96.)

Crataegus sp. (Malaceae.) 43430. Seeds from Mazatenango, Guatemala. Collected by Mr. Wilson Popenoe, Agricultural Explorer. "**Manzanilla**, a common fruit in the markets of Guatemala towns and villages, coming, it is said from the highlands. I have seen no plants as yet. The fruits look like small apples; they are nearly spherical in form, an inch to an inch and a quarter in diameter, deep yellow in color with russet dots and one cheek frequently blushed with red. The thin skin encloses a rather dry, mealy pulp and three irregularly shaped seeds. The flavor resembles that of some of the northern haws, but is, perhaps, somewhat better; the fruit is extensively used here for the preparation of *dulces* of various sorts, such as jams and jellies. This plant would probably succeed both in California and Florida." (Popenoe.)

Enterolobium timbouva Martius. (Mimosaceae.) 43455. Seeds of **Timbo** from Argentina. Collected by Mr. H. M. Curran. A tree found throughout all of northern Argentina, and used as an ornamental in Buenos Aires. It is unarmed, and the leaves consist of two to five pairs of pinnae and ten to twenty pairs of pinnules. The greenish flowers occur in large heads or clusters, and the coriaceous, indehiscent, kidney-shaped pods are fleshy within and contain elliptic seeds. These pods are called *orejas de negro* in Argentina. From the trunks canoes are made, and the beautiful, striped wood is used for a great many purposes, such as general construction work, furniture, etc., and for paper pulp, and is a source of saponin. The bark and leaves are said to be poisonous to fish, and the pods are used to remove stains from clothes, and the seeds appear to be poisonous. (Adapted from Lillo, *Contrib. Arboles Argentina*, p. 41, from Correa, *Flora do Brazil*, p. 70, and from Bailey, *Standard Cyclopedia of Horticulture*, p. 116.) "Is a very important timber tree and one of the most rapid growing trees of the tropics. Much appreciated in Buenos Aires as a shade tree. Reaches its best development in tropical forests but endures cold and drought in a moderate form." (Curran.)

Garcinia mangostana L. (Clusiaceae.) 43481. Seeds of Mangosteen from Peradeniya, Ceylon. Presented by Mr. C. Drieberg, Secretary, Ceylon Agricultural Society. "A moderate-sized conical tree, with large leathery leaves, indigenous to Malaya. Its globular purplish brown fruit, about the size of an apple, is famed as one of the most delicious fruits of the tropics, some writers describing it as 'perhaps the most luscious fruit in the world, partaking of the flavor of the strawberry and the grape.' The delicate white juicy pulp surrounding and adhering to the seed is the part eaten. In striking contrast to it is the dense, thick, reddish rind, containing tannic acid and a dye. The fruit is in season in the low country of Ceylon from April to June, and at higher elevations from June to August or September. Here it is usually sold in the markets, or hawked about, at 75 cents (Ceylonese) to 1 rupee per dozen; (24 to 32 cents U.S. gold.) It is always charged for on hotel menus as an extra. The tree is of very slow growth, and does not usually come into bearing till about nine or ten years old. The essential conditions for it are a hot, moist climate, and deep, rich well-drained soil. It thrives up to 1500 feet elevation in the moist region, but may also be grown in moderately dry districts with irrigation. Propagation is usually by seed, but may also be effected by gootee or layering. Sow seeds in pots under cover. The plants are of very slow growth, taking about two years to become large enough for planting out, being then only about 12 inches high." (Macmillan, Handbook of Tropical Gardening & Planting, p. 164 & 165.)

Ilex paraguariensis St. Hilaire. (Aquifoliaceae.) 43456. Seeds of **Yerba de mate** from Argentina. Collected by Mr. H. M. Curran. A small, bushy, evergreen tree with serrate alternate leaves, native of Brazil and Paraguay and the neighboring countries. The leaves are roasted and ground to make the Paraguay-tea of commerce, which is said to possess the good properties of tea and coffee without their after-effects. In the hospitals of Paris it is used as a stimulant. The Yerba groves are located in remote regions, and grow best on high land at an elevation of 1,000 to 2,000 feet, in soft alluvial soil or soil rich in humus. The seed is very difficult to germinate, and without special treatment requires a year before it will come up. An opinion prevails that these seeds will ger-



PASSION FLOWER IN FULL BLOOM, PASSIFLORA SP., S. P. I. No. 35215.

Although passion flowers have been grown in the conservatories of Europe for generations and their remarkable flowers considered emblems of the Crucifixion, and although at least one species (*P. edulis*) has become of commercial importance in Australia and is even grown for market in Scotland, practically no attention has been given to them by Americans. The ease with which they can be grown, their productiveness, the existence of so many edible-fruited species, and the fact that they hybridize readily would seem to make the field of their exploitation a promising one. Photograph (P19576FS) taken by P. H. Dorsett, in greenhouse at Chico, Cal., Field Station, May 16, 1916.



YOUNG FRUITS AND FLOWERING BRANCH OF PASSION VINE, *PASSIFLORA* SP.

The large flowers, ease of propagation from cuttings, existence of numerous edible fruited species, and the unique and delicate flavor of the finer sorts, together with the unrivaled shipping qualities of the fruit and the presence of hardy species in America would seem to make the problem of creating a new hardy fruiting vine for the Southern States a promising one. Photograph (P19657FS) taken by P. H. Dorsett, Chico Field Station, May 16, 1916. Natural size.

minate only after being eaten by birds, and a substitute for the gastric juice of the birds has been sought. By a method in use at San Ignacio, Argentina, seedlings have been obtained in five weeks. This plant might be grown in Texas and California. (Adapted from Friderici, *Tropenpflanzer*, 1907, pp. 776-783.) The *Ilex* is a plant of humid forest regions but will also endure the climate of Buenos Aires. It should be a good plant for Florida and perhaps the coast region as far north as the Cape Fear River, North Carolina. In nature it is a forest plant. In cultivation a light shade is often placed over the plants." (Curran.)

Lepargyrea argentea (Pursh.) Greene. (Elaeagnaceae.) 43472. Plants of Buffalo berry secured near Pierre, South Dakota. Collected Dr. David Griffiths and grown at the Plant Introduction Field Station, Chico, Cal. "The **Buffalo berry** is a native of the Missouri river valley and westward. In limited localities it has played a rather important role as a jelly fruit. It grows into a large shrub or small tree, resembling rather closely in leafage the so-called Russian olive belonging to the genus *Elaeagnus*. The fruit is about the size of a currant and varies in color from yellow to red. It is not at all palatable until very late in the season, after it has partly dried so that the skin is wrinkled and presents a withered appearance. To most tastes it is not palatable at all in the raw state, but makes a jelly of very superior quality. The fruit is gathered by shaking the trees very late in the season, and catching the falling berries upon sheets. The yellow form is usually preferred to the red for culinary purposes." (Griffiths.)

Lonchocarpus sp. (Fabaceae.) 43457. Seeds from Argentina. Collected by Mr. H. M. Curran. The species of this genus are either trees or shrubs, with alternate leaves and opposite leaflets. The papilionaceous flowers are white, pink or purple, and occur in simple or branched racemes. The membranous or coriaceous pods are flat and dehiscent, containing from one to four or rarely more flat, kidney-shaped seeds. An indigo-like dye is said to be obtained from this genus, but it is not known in the trade and is little cultivated. (Adapted from Humboldt, Bonpland & Kunth, *Nova Genera et Species*, vol. 6, p. 383, 182, and from Bailey, *Standard Cyclopedia of Horticulture*, p. 1904.)

Mida acuminata (R. Br.) Kuntze. (Santalaceae.) 43423. Seeds of **Quandong** from Sydney, Australia. Presented by Mr. Fred Turner of the Linnean Society, through the American Consul General. "Var. *Chrysocarpa*. A rare Australian tree. From an economic point of view, the yellow quandong is a superior fruit to the red quandong, and it grows under precisely similar climatic conditions." (Turner.) A beautiful evergreen tree, up to 30 feet in height, with opposite, lanceolate leaves, mostly two or three inches long, and rather numerous insignificant flowers, appearing on small, terminal branches. The reddish, globular fruits are about three-fourths inch in diameter, and are eaten as preserves and jelly, and in the dried condition. The kernels, which are spherical, are quite palatable, and so full of oil that they will burn entirely away with a clear light. The tree, when full of fruits, is decidedly ornamental. The bark contains a large amount of tannic acid, and the wood is used for turnery carving and cabinet work. In cultivating this tree, it is best raised from seeds planted in the places where it is intended that the trees are to grow permanently. This tree is found throughout Australia, except Tasmania and Queensland. (Adapted from F. Turner, Sydney Morning Herald.)

Passiflora ligularis Juss. (Passifloraceae.) 43437. Seeds of **Granadilla** from Guatemala City, Guatemala. Collected by Mr. Wilson Popenoe, Agricultural Explorer. "A species of *Passiflora* cultivated in the highlands of Guatemala, up to to elevations of 5000 feet or above. The fruit is the size of a hen's egg, orange-yellow in color when fully ripe, with a thick brittle shell enclosing a large number of small, thin seeds by white, gelatinous pulp. The flavor is delicate, aromatic, almost perfumed, certainly more delicate and agreeable than most of the other *Passifloras* which produce edible fruits. This species should be given a more thorough trial in Florida and California than has been done in the past." (Popenoe.)

Persea americana Miller. (Lauraceae.) 43476. Cuttings of **Avocado** from Amatitlan, Guatemala. Collected by Mr. Wilson Popenoe, Agricultural Explorer. "A fruit of good size, averaging about one pound in weight, of very desirable shape, regularly oval, with a seed rather small in comparison to the size of the fruit. The surface is smooth, deep green in color; the quality

is said to be very good, and the tree is productive. Taken all around, it looks like a very excellent quality. The parent tree is young, probably 5 or 6 years old, and stands about 20 feet in height, with an erect crown, extending almost to the ground, about 10 feet broad, and well branched. The trunk is 6 inches thick at the base. The tree is producing over 100 fruits this year. At this time they do not appear to be quite mature. They are said to ripen in November, at the same time the flowers for the next year's crop make their appearance. Doubtless they would be much better in quality if left on the tree several months longer, but it is the usual thing here to pick the fruits as soon as they reach maturity. A description of the fruit follows: Form uniformly oval; size above medium to large, weight 14 to 18 ozs., length $4\frac{1}{2}$ inches, greatest diameter $3\frac{1}{2}$ inches, base rounded, with the stem inserted obliquely without depression; stem stout, about 6 inches long; apex rounded, with the stigmatic point to one side and slightly raised; surface nearly smooth, slightly undulating and sometimes obscurely ribbed, deep green in color, almost glossy, with a few scattering large yellow dots; skin thick, slightly over $\frac{1}{16}$ inch at base, nearly $\frac{1}{8}$ inch at apex, coarsely granular, brittle; flesh cream color, pale green near the skin, free from fiber; flavor said to be rich; quality probably very good; seed rather small in comparison to size of fruit, almost spherical, $1\frac{3}{4}$ inches long and broad, with both seed coats adhering closely, and tight in the seed cavity." (Popenoe.)

Persea sp. (Lauraceae.) 43432. Seeds of **Anay** from Mazatenango, Guatemala. Collected by Mr. Wilson Popenoe, Agricultural Explorer. "An interesting species of *Persea* which occurs in this region as a large forest tree, and is called *anay* by the natives. It so closely resembles an avocado of the Mexican type in the external appearance of the fruit as to lead one to suspect at first that it must be a form of *Persea americana*, but on a closer examination of the tree and fruit, one finds numerous characters which indicate that it must be an entirely distinct species of *Persea*, but just what species it may be I am unable to say. In clearing the forest for planting coffee, some large trees are left to provide shade for the coffee plants, and it was due to this fact that we found the *anay*. Two large trees are standing close to the entrance of the

finca 'El Compromiso', about one-half mile from Mazatenango. Others are said to occur in the forest, and are known to the natives, who eat the fruits in the same way as avocados, and consider them a variety of avocado, - 'tipo de aguacate', as they say. The *anay* is a tall, rather slender tree, reaching to a great height in the forest, the two which were seen being, probably, between 60 and 70 feet in height. The bark is nearly smooth, and of a rich red-brown color, grayish in places. The young branchlets are light brown, and finely pubescent. The leaf blades are broadly elliptic to oblong-lanceolate in outline, 8 to 13 inches long, 3 to 6 inches broad, acute to shortly acuminate at the apex, rounded to broadly acute at the base, rigidly chartaceous, bright green and glabrous above, with the exception of the costa and primary transverse veins, which are sparsely hairy, the lower surface slightly lighter in color and glabrate. The young leaves are softly pubescent below, sparsely hairy above. Petiole $1\frac{1}{2}$ to $2\frac{1}{2}$ inches long, terete, slender, but swollen just below the point of union with the lamina. The foliage, when crushed, has no aromatic odor as does the Mexican type of *P. americana*. The flowers are said by the natives to be produced in May. The fruits ripen in August and September. In form they are slender pyriform, sometimes curved, and sometimes pointed at the apex. Often the neck is long and sharply defined. The body of the fruit is slightly compressed on two sides. In length the fruit varies from 4 to 6 inches. The surface is smooth, glossy, and purplish black in color. The epicarp is exceedingly thin and membranous, and adheres closely to the firm, oily flesh, which is divided into two zones of color, the outer being pale green, and the inner, which is of the same thickness as the outer, greenish cream color. The two zones are more sharply defined than they ordinarily are in the cultivated avocados. The flavor of the flesh is rich and bland, like that of a very good avocado, but having a faint suggestion of sweetness. The outer seed coat is developed into a thick husk which may be practically be considered an endocarp. Within lies the seed, which is long and pointed, with the inner seed coat, thin and membranous, surrounding the cotyledons closely. While the outer seed coat is extended clear to the base of the fruit, the inner does not always reach the apices of the cotyledons. The embryo lies immediately at the base of the cotyledons, while the avocado has the em-

bryo located some distance above this point. From a practical standpoint, the *anay* cannot be considered of great value, inasmuch as the flesh is scanty in quantity. If it were more abundant, its excellent flavor would make the fruit of great value. The fruit falls to the ground while still hard, and requires two or three days to soften and be in condition for eating. The seeds germinate on the ground beneath the trees, and the young plants start off lustily. The larva of some insects, presumably a beetle, attacks the fallen fruits, and tunnels through the seeds. Very few fruits were found on the ground which had not been attacked in this manner. The remarkable similarity which this species bears to the cultivated avocado, and the fact that its fruit is edible and is used by the natives, makes it a subject of particular interest in connection with the study of the cultivated avocados. It is to be hoped that specimens can be reared and fruited in the United States. The region where the tree is found lies at an elevation of about 1200 feet, and is quite moist. On this account, it seems doubtful if the *anay* will succeed in California. It might be tried in the most protected localities. In south Florida its chances of success seem good." (Popenoe.)

Pinus merkusii Jungh. & DeVriese. (Pinaceae.) 43462. Seeds of a pine from Buitenzorg, Java. Presented by the Director, Botanic Gardens. This tree, which is the only pine found south of the equator, attains a height of 100 feet, and forms a flat, umbrella-like crown. It is found in Burma, Borneo, Sumatra and the Philippines, chiefly at elevations of 3000 to 4000 feet. The leaves are in clusters of two, the cones are usually in pairs, and the seeds are small, much shorter than the unequal-sided wing. The wood is very resinous, and the trunks are used for masts and spars. (Adapted from Brandis, Indian Trees, p. 691, and from von Mueller, Select Extra-Tropical Plants, 393, 394.)

Piptadenia excelsa (Griseb.) Lillo. (Mimosaceae.) 43458. Seeds from Argentina. Collected by Mr. H. M. Curran. An unarmed tree, almost 100 feet high, with 15 to 20 pairs of leaflets in each leaf, and spikes of flowers two or three inches long. The pods are linear. The rather thin bark is not used in tanning as the other species. The rosy wood, which resembles that of *Piptadenia macrocarpa*, is tough and straight-

grained, and is used by the carpenters of Jujuy for various kinds of work. It is indigenous to the northern part of Argentina, and is not exported in the south. (Adapted from Grisebach, *Plantae Lorentzianae*, p. 121 as *Piptadenia communis excelsa*, and from Lillo, *Contr. Arboles Argentina*, p. 48.) Important timber trees and also planted as shade trees in Buenos Aires. (Curran.)

Piptadenia macrocarpa Benth (Mimosaceae.) 43459. Seeds from Argentina. Collected by Mr. H. M. Curran. An unarmed tree, native of Brazil, with grayish tomentulose twigs and branches, and 10 to 25 pairs of pinnae, each with 20-40 pairs of pinnules, hardly two millimeters long. The flowers occur in peduncled heads in the axils of the leaves, sometimes at the ends of the branchlets. The pods are half a foot long and more, and an inch wide with thickened margins. (Adapted from Benth, *Hooker's Journal of Botany*, vol. 4, p. 341, and from Bailey, *Standard Cyclopedia of Horticulture*, p. 2647.) Important timber trees and also planted as shade trees in Buenos Aires. (Curran.)

Prunus salicifolia H. B. K. (Amygdalaceae.) 43425. "Cereza. Seed of a wild cherry brought to the market of Mazatenango from the *tierra fria* or highlands. The fruit is one-half to five-eighths of an inch in diameter, sometimes round but more commonly oblate in form, shiny purplish black in color. In size and general appearance it closely approaches an English *Morello* cherry, though perhaps a trifle smaller. The flesh, which is dark colored and juicy, is rather meaty in texture, and has the flavor of the *Oxheart* cherry grown in the Western United States, with the addition of a trace of bitterness. The fruit is esteemed, and is used in several ways, principally as a fresh fruit and for the preparation of preserves. The tree is said to be medium sized, and to grow in the mountains some distance back from the coast, at a considerable elevation." (Wilson Popenoe.)

Pyrus chinensis x communis (Malaceae.) 43442. Plants grown at the Plant Introduction Field Station, Chico, California. Hybrid pear raised by Dr. W. Van Fleet, in 1907 and presented to the Plant Introduction Field Station, Dec. 22, 1909. "Fruit large and of attractive pyriform shape, somewhat resembling *Bartlett* but with a deep red cheek on yellow ground. Flesh fine grained, tender and juicy with but few granules, fla-

vor sweet and pleasant, quality very good. Should make an attractive market pear. It is hoped the usual resistance of Oriental pears to blight will be shown by this hybrid variety." (Dr. Van Fleet.)

Rubus sp. (Rosaceae.) 43438. Seeds of **Mora** from Guatemala City, Guatemala. Collected by Mr. Wilson Popenoe, Agricultural Explorer. "A wild species of *Rubus* which is common in the vicinity of San Lucas, an altitude of nearly 7000 feet. The plants greatly resemble the blackberry in habit, growing to a height of 6 or 7 feet. The fruit also resemble blackberries being about the same size, with the individual drupelets like those of the blackberry, but slightly lighter in color. The flavor is rather acid, suggesting both the blackberry and the loganberry. The fruit is gathered from the wild plants and brought by the Indians to the market of Guatemala City, where it is a common sight. It is used for preserves and for stewing." (Popenoe.)

Saccellium lanceolatum Humb. & Bonpl. (Boraginaceae.) 43460. Seed from Argentina. Collected by Mr. H. M. Curran. A tree, 2 to 4 m. in height, with many branches, and a trunk 3 dm. in thickness. The alternate, lanceolate leaves are 10 to 16 cm. in length, and the terminal racemes of inconspicuous dioecious flowers resemble minute bouquets. The fruit is a small drupe. The wood of this tree is about the same in color and texture as that of the ash (*Fraxinus excelsior*). This tree is found in the Peruvian Andes, on the tributaries of the river Guancabamba. (Adapted from Humboldt and Bonpland, *Plantae Equinoxiales*, pp. 41-44.)

Schinopsis lorentzii (Griseb.) Engler. (Anacardiaceae.) 43461. Seeds of **Quebracho** from Argentina. Collected by Mr. H. M. Curran. A tall, timber tree, native of central South America, attaining a height of 50-75 feet, and a diameter of two to four feet. The leaves are composed of 10-15 pairs of pinnae and the flowers occur in panicles. The fruit is a dry, indehiscent samara. The heartwood of this tree is one of the hardest, heaviest, and, in the region of its occurrence, most durable woods known. It contains a large amount of tanning, which acts as a preservative, and is used extensively for railroad ties, wharves, dry docks, fence posts, etc. The tannin of which the heartwood contains from 20 to 24 per cent, is a very important

product of this tree. The wood is whiter than that of *Quebracho colorado* of Chaco. (Adapted from Mell, Forestry Circular 202, on Quebracho Wood, and from Lillo, Contr. Arboles Argentina, p. 3.)

Sicana odorifera (Vell.) Naudin. (Cucurbitaceae.) 43427. Seeds from Mazatenango, Guatemala. Collected by Mr. Wilson Popenoe, Agricultural Explorer. "A peculiar melon called here **melocoton** (peach). It is not commonly cultivated, and is only occasionally seen in the market. It is cylindrical, a foot in length, about four inches in diameter, with a smooth surface shining black in color. On cutting the melon in halves lengthwise, one finds a narrow zone of flesh next the skin, and the rest of the space occupied principally by seeds, which resemble considerably those of the watermelon. The flavor is rather strong, and suggests that of a canteloupe. Not to be recommended for cultivation as a comestible, but may be of interest to those studying the cucurbits." (Popenoe.)

Simaba cedron Planchon. (Simaroubaceae.) Seeds of **Cedron** from Cristobal, Canal Zone. Presented by Mr. O. W. Barrett. "Mr. Sandberg believes these nuts are high in tannic acid content and also possess some good medicinal qualities since they are used in several native remedies about here. The tree reaches some 15 to 25 feet in height and bears great quantities of these brownish fruits consisting of the large seed and a layer, 5 to 15 mm. thick, of reddish yellow flesh, bitter and acrid." (Barrett.) A short, erect, graceful tree with a trunk about six inches in diameter, and large, alternate, pinnate leaves, composed of 20 or more pairs of leaflets. The white flowers occur in long racemes, similar to those of *S. trichilioides*. The oval fruits, which are 6 cm. ($2\frac{1}{2}$ inches) long, are edible. A bitter principle is found throughout the plant, but only the seeds are used medicinally. These seeds are intensely bitter, and are used as a remedy for snake bite, hydrophobia, and in treating fevers and dysentery. If more than 25 or 30 grains are given in a single dose, death may result. This tree is found in Colombia, Panama, and Costa Rica. (Adapted from Heraud, Nouveau Dictionnaire des Plantes Medicinales, pp. 563-565, and from Planchon, in Hooker's Journal of Botany, vol. 5, p. 566.)

Viroa surinamensis (Rol.) (Myristicaceae.) 43424.
Seeds of *Ucuuba* from Para, Brazil. Presented by Mr. George H. Pickerell, American Consul. "Myristicaceae are more important as timbers than the Annonaceae, in spite of being represented by a much smaller number of species, especially the two commonest species of the Amazon, *ucuuba branca* (*Virola surinamensis* Warb.) and *ucuuba vermelha* (*Virola sebifera* Aubl.) The first, especially, is one of the most useful trees of the Amazon region, not only for its easily worked wood, moderately hard, but also for its seeds, which furnish a kind of vegetable wax rich in stearin. While the *ucuuba branca* is found principally in the varzeas (probably meaning low, swampy valleys) it is not excluded from the terra firma (meaning dry ground); the *ucuuba vermelha*, which is distinguished by its larger leaves and smaller fruits, is a tree of the dry land and is found principally in the forests. Both these species have, especially when young, a characteristic manner of growth, with slender whorled branches furnished with regularly distichous leaves. The regularity of its branching reminds one of the European conifers. Without doubt other Amazonian species of *Virola* and probably also some species of *Iryanthera* furnish wood which could be utilized, but I have no positive knowledge in regard to this." (J. Huber, *Mattas e Madeiras Amazonicas*, Boletim de Museu Goeldi, vol. 6, p. 174, 1910.) The wood of this Brazilian tree is used for interior work and general carpentry. The bark is medicinal and the fruits contain 55 per cent of myristin, a waxy substance of the consistency of beef tallow, used in the trade for candles and soap. (Adapted from Correa, *Flora do Brazil*, pp. 70, 71.)

United States Department of Agriculture.
Bureau of Plant Industry.
Office of Foreign Seed and Plant Introduction.
Washington, D. C.

Scientific Staff.

David Fairchild, Agricultural Explorer in charge.
P. H. Dorsett, Plant Introducer in charge of Plant Introduction
Field Stations.
B. T. Galloway, Plant Pathologist.
Peter Bisset, Plant Introducer in charge of Foreign Plant Dis-
tribution.
Frank N. Meyer and Wilson Popenoe, Agricultural Explorers.
H. C. Skeels, Botanical Assistant, in charge of Collections.
S. C. Stuntz, Botanical Assistant, in charge of Explorers' Notes,
Foreign Correspondence and Publications.
R. A. Young, Botanical Assistant, in charge of Dasheen and Tung
Oil Investigations.
David A. Bisset, Nathan Menderson and G. P. Van Eseltine,
Assistants.

Staff of Field Stations.

R. L. Beagles, Farm Superintendent in charge of Chico, Calif.,
Plant Introduction Field Station.
J. M. Rankin, Assistant Farm Superintendent, in charge of Rock-
ville, Md., (Yarrow) Plant Introduction Field Station.
Edward Goucher, Propagator.
Edward Simmonds, Gardener and Field Station Superintendent in
Charge of Miami, Fla., Plant Introduction Field Station.
J. E. Morrow, Assistant Superintendent, Brooksville, Fla., Plant
Introduction Field Station.

Collaborators.

Mr. Aaron Aaronsohn, Haifa, Palestine.
Mr. Thomas W. Brown, Cairo, Egypt.
Mr. H. M. Curran, Laurel, Md.
Mr. M. J. Dorsey, University Farm, St. Paul, Minn.
Mr. H. T. Edwards, Ridgewood, N. J.
Dr. Gustav Eisen, California Academy of Sciences, San Francisco,
Calif.
Mr. E. C. Green, Serviço do Algodao no Brazil, Rio de Janeiro,
Brazil.
Mr. A. C. Hartless, Saharanpur, India.
Mr. E. J. Kraus, University of Chicago, Chicago, Ill.
Mr. Barbour Lathrop, Chicago, Ill.
Miss Eliza R. Scidmore, Yokohama, Japan.
Mr. Charles Simpson, Little River, Fla.
Mr. H. P. Stuckey, Experiment, Ga.
Dr. L. Trabut, Director, Service Botanique, Algiers, Algeria.
Mr. E. H. Wilson, Arnold Arboretum, Jamaica Plain, Mass.